# WP-8 Mr.Lyons.com

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**1) Thirty students bought pennants for the football game. Plain pennants cost $4 each and fancy ones cost $8 each. If the total bill was $168, how many students bought the fancy pennants?**

**Step-by-step Setup & Solution:**
- Let $p$ = number of plain pennants, and $f$ = number of fancy pennants.
- Equation 1 (Quantity): $p + f = 30 \implies p = 30 - f$
- Equation 2 (Value): $4p + 8f = 168$
- Substitute $p$: $4(30 - f) + 8f = 168$
- Expand: $120 - 4f + 8f = 168 \implies 120 + 4f = 168$
- Solve: $4f = 48 \implies f = 12$

**Answer: 12 students bought fancy pennants.**

**2) Adult tickets for the game cost $4 each and student tickets cost $2 each. A total of 920 tickets worth $2446 were sold. How many student tickets were sold?**

**Step-by-step Setup & Solution:**
- Let $A$ = number of adult tickets, and $S$ = number of student tickets.
- Equation 1 (Quantity): $A + S = 920 \implies A = 920 - S$
- Equation 2 (Value): $4A + 2S = 2446$
- Substitute $A$: $4(920 - S) + 2S = 2446$
- Expand: $3680 - 4S + 2S = 2446 \implies 3680 - 2S = 2446$
- Solve: $-2S = -1234 \implies S = 617$

**Answer: 617 student tickets were sold.**

**3) A collection of 40 dimes and nickels is worth $2.90. How many nickels are there?**

**Step-by-step Setup & Solution:**
- Let $d$ = number of dimes, and $n$ = number of nickels.
- Equation 1 (Quantity): $d + n = 40 \implies d = 40 - n$
- Equation 2 (Value in cents): $10d + 5n = 290$
- Substitute $d$: $10(40 - n) + 5n = 290$
- Expand: $400 - 10n + 5n = 290 \implies 400 - 5n = 290$
- Solve: $-5n = -110 \implies n = 22$

**Answer: There are 22 nickels.**

**4) Hans paid $1.50 each for programs to the game. He sold all but 20 of them for $3 each and made a profit of $15. How many programs did he buy?**

**Step-by-step Setup & Solution:**
- Let $x$ = number of programs bought.
- Total Cost = $1.50x$
- Programs Sold = $x - 20$
- Total Revenue = $3(x - 20) = 3x - 60$
- Profit Equation: $ ext{Revenue} - ext{Cost} = ext{Profit} \implies (3x - 60) - 1.50x = 15$
- Simplify: $1.50x - 60 = 15 \implies 1.50x = 75$
- Solve: $x = 75 / 1.50 = 50$

**Answer: Hans bought 50 programs.**

**6) The Audio Outlet purchased 60 cassette recorders, gave away three in a contest, and sold the rest at twice their purchase price. If the store's total profit was $1188, how much did the store sell each recorder for?**

**Step-by-step Setup & Solution:**
- Let $C$ = purchase price per recorder.
- Total Cost = $60C$
- Recorders Sold = $60 - 3 = 57$
- Selling Price = $2C$
- Total Revenue = $57 imes 2C = 114C$
- Profit Equation: $ ext{Revenue} - ext{Cost} = 1188 \implies 114C - 60C = 1188$
- Simplify: $54C = 1188 \implies C = 22$
- Target: Selling Price = $2C = 2(22) = 44$

**Answer: The store sold each recorder for $44.**

**7) A plumber makes $4.50 per hour more than his apprentice. During an 8-hour day, their combined earnings total $372. How much does each make per hour?**

**Step-by-step Setup & Solution:**
- Let $A$ = hourly rate of apprentice, and $P$ = hourly rate of plumber.
- Relationship: $P = A + 4.50$
- Combined Daily Earnings Equation: $8P + 8A = 372$
- Substitute $P$: $8(A + 4.50) + 8A = 372$
- Expand: $8A + 36 + 8A = 372 \implies 16A + 36 = 372$
- Solve: $16A = 336 \implies A = 21$
- Find $P$: $P = 21 + 4.50 = 25.50$

**Answer: The apprentice makes $21.00/hour, and the plumber makes $25.50/hour.**

**8) I have eight more quarters than dimes. If the coins are worth $6.20, how many dimes are there?**

**Step-by-step Setup & Solution:**
- Let $d$ = number of dimes, and $q$ = number of quarters.
- Relationship: $q = d + 8$
- Equation (Value in cents): $10d + 25q = 620$
- Substitute $q$: $10d + 25(d + 8) = 620$
- Expand: $10d + 25d + 200 = 620 \implies 35d + 200 = 620$
- Solve: $35d = 420 \implies d = 12$

**Answer: There are 12 dimes.**